



**Audit Report No. 2007-05
DEPARTMENT OF PUBLIC UTILITIES
NATURAL GAS HEDGING PRACTICES REVIEW**

Prepared by

CITY AUDITOR

Richmond, Virginia

August 31, 2006

Submitted to

The Honorable Members of City Council

Executive Summary

August 31, 2006

The Honorable Members of City Council
City of Richmond

Subject: Natural Gas Hedging Practices Review

The City Auditor's Office has completed a review of the natural gas hedging practices employed by the Department of Public Utilities (DPU). The objective of the review was to evaluate the effectiveness and adequacy of DPU's natural gas hedging practices.

Background:

The Department of Public Utilities serves approximately 100,000 residential, commercial and industrial customers. During FY05-06, DPU purchased natural gas of approximately **\$192 million**. DPU purchases natural gas by using either hedging process or market based prices.

What is Hedging?

Hedging is a process, which attempts to provide natural gas price stability. It aims to avoid exposure to large price fluctuations. It does not guarantee the lowest possible prices. Hedging works like an insurance policy designed to prevent losses due to significant price increases. However, it is not a tool to make a profit.

Results:

- The current policy does not define in detail oversight roles, responsibilities and authorities of DPU management and representatives of the City administration. Auditor could not attest to adherence to the policy because a written annual plan was not developed. Furthermore, a formal risk management strategy needs to be documented.

- The City uses a supplier as a source of information to make decisions. In order to manage **\$192 million** procurement, the City must obtain guidance from an independent third party who does not have a vested interest in the transactions. This is necessary to assure accountability over the procurement and provide assurance that procurement is conducted at prices to benefit consumers.
- Overall, based on a review of DPU's performance over three years, the hedging provided better results than purchasing natural gas in the open market. However, DPU uses these procedures to manage price volatility on only 38% of the total demand. For effective hedging, current knowledge of day-to-day market conditions and price trends is necessary. In addition, the City may need additional expertise to explore the full potential of using financial tools. The City may cover the risk of price volatility for a much larger portion of the total annual demand for natural gas and generate substantial savings.
- Customers' rates have remained relatively constant with DPU's costs. DPU appears to have managed customers' natural gas rates very effectively.

Recommendations:

The following recommendations made in the report are listed in the order they appear in the detailed report:

- 1. Require DPU to revise the natural gas risk management policy. The policy should delineate the roles and responsibilities of all parties involved.*
- 2. Segregate the duties between the personnel who make transactions and the personnel who confirm, monitor or report on those transactions.*
- 3. Require DPU to hire a professional firm engaged in dealing with natural gas and energy trading to assist the City in managing future hedging transactions.*

These recommendations have been shared with and concurred by DPU management. If you have any questions related to this report, please contact the City Auditor's Office.

Umesh Dalal, CPA, CIA, CA
City Auditor

Introduction

The City Auditor's Office received a request to review the natural gas hedging practices employed by the Department of Public Utilities (DPU). The request originated from a citizen's concern regarding DPU's high natural gas prices during the 2005-2006 winter heating months (November through March). Accordingly, Auditors conducted a review of DPU's natural gas hedging practices.

Standards

The scope of this project was significantly limited compared to a comprehensive audit conducted in accordance with Government Auditing Standards issued by the Comptroller General of the United States. However, during this project, auditors reviewed supporting documents and conducted other appropriate tests that were consistent with the requirements of these standards.

Objectives

The objectives of the review were to:

- Assess the effectiveness of DPU's natural gas hedging practices
- Assess the adequacy of the natural gas hedging policy and procedures
- Determine whether DPU adhered to its natural gas hedging policy

Methodology

To accomplish the above objectives, Auditors:

- Interviewed DPU staffs

- Analyzed DPU's prices during the winter heating seasons of 2001 - 2006 and summarized the results of their natural gas cost history against NYMEX¹ prices.
- Reviewed the natural gas hedging policy
- Verified supporting documentation for compliance with the hedging policy
- Benchmarked policy against other utilities companies /localities

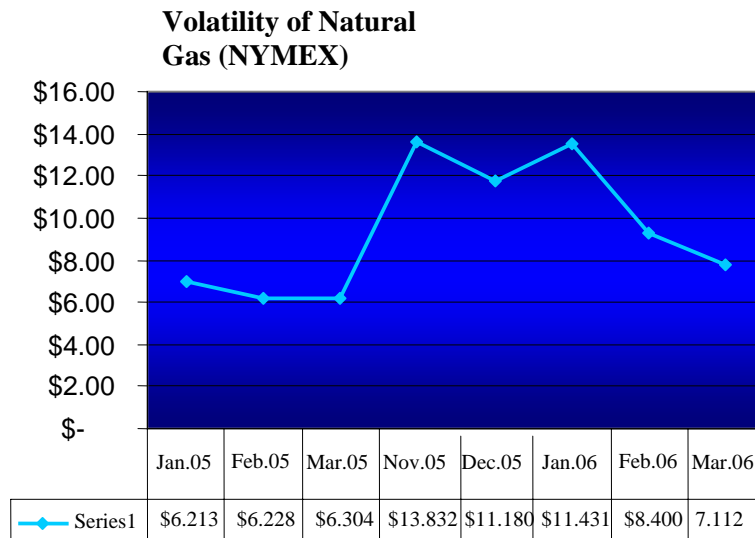
¹ NYMEX is the New York Mercantile Exchange where energy and metal futures and options are traded.

Background

The Department of Public Utilities serves approximately 100,000 residential, commercial and industrial customers within the City of Richmond, Henrico County and northern Chesterfield County. The customers are served through more than 1,800 miles of gas mains. During FY05-06, DPU purchased natural gas of approximately **\$192 million**.

Natural Gas Price Fluctuations

As depicted in the following graph, the prices of natural gas fluctuated dramatically during 2005-2006 winter heating season. According to the City's vendor, British Petroleum, several hurricanes during this time had considerable impact on the price of natural gas.



According to the vendor, recent natural calamities and increasing industrial demand for natural gas, prices of natural gas have increased substantially. The price of natural gas is affected by numerous factors such as weather, economic activity, and availability of supplies. Depending upon the timing and the strength of these factors, the price of natural gas can increase or decrease significantly.

Residential customers that rely on natural gas to heat their homes are especially vulnerable to price spikes because they may have limited ability to switch to alternate fuels for heating their homes.

What is Hedging?

Price fluctuations can create uncertainty in determining the resources needed to procure the required quantity of natural gas. For organizations such as the City of Richmond, which acquires and supplies natural gas to the City residents, it becomes difficult to prevent fluctuations in their monthly gas bills.

Hedging is a process which attempts to provide natural gas price stability. It aims to avoid exposure to large price fluctuations. Hedging does not guarantee the lowest possible prices, it does however, provide protection against price spikes. It should be noted that hedging works like an

insurance policy designed to prevent losses due to significant price increases. However, it is **not** a tool to make a profit.

Hedging Process
at the City of
Richmond

Current Policy:

DPU has a natural gas hedging policy. According to the policy, the Fuels Procurement Administrator at DPU develops an annual hedge plan with the assistance of the natural gas asset manager, who is also a supplier. Furthermore, the Fuels Procurement Administrator completes a market assessment that includes input from the Asset Manager and trade publications analyses. The DPU's Gas Rate Team includes representatives from the Departments of Public Utilities, Finance, and Chief Administrative Office.

The current policy does not define in detail oversight roles, responsibilities and authorities. Clarifying the roles of each group will help improve oversight on this function. Auditor could not attest to adherence to the policy because a written annual plan was not developed. Furthermore, a formal risk management strategy needs to be documented.

The City uses a supplier as a source of information to make decisions. In order to manage **\$192,522,362** procurement, the City must obtain guidance from an independent third party who does not have a vested interest in the transactions.

This is necessary to assure accountability over the procurement and provide assurance that procurement is conducted at prices to benefit consumers.

Recommendations

1. *Require DPU to revise the natural gas risk management policy. The policy should delineate the roles and responsibilities of all parties involved.*

***Management
Response***

DPU agrees with this recommendation and will revise the existing policy accordingly. This project will be done by the Fuels Procurement Administrator and completed by October 31, 2006.

2. *Segregate the duties between the personnel who make transactions and the personnel who confirm, monitor or report on those transactions.*

***Management
Response***

DPU agrees with this recommendation. The revised policy will address the separation of duties as described.

City of Richmond Auditor's Office

Natural Gas Hedging Review

August 2006

Page 10 of 17

Performance

Auditors reviewed and analyzed the results of the City's hedging strategies executed for Large Volume Service (LVS) and Purchased Gas Cost (PGC) customers during the FY 2001-2006 winter heating seasons. Overall, the City has accomplished its objective to keep stable prices without incurring losses for the natural gas hedged. However, the amounts hedged were minimal. The individual hedging results of the winter season months are depicted below:

Historical hedging results for LVS customers:

Fiscal Year	Hedged (Decatherms)	Actual Cost	Market Cost	Savings/ (deficit)
03	151,000	\$558,700	\$852,164	\$293,464
04	228,000	\$1,151,400	\$1,203,308	\$51,908
05	528,500	\$3,276,700	\$3,640,445	\$363,745
06	484,000	\$5,798,320	\$4,626,452	\$(1,171,868)
Total	1,391,500	\$10,785,120	\$10,322,369	\$(462,751)

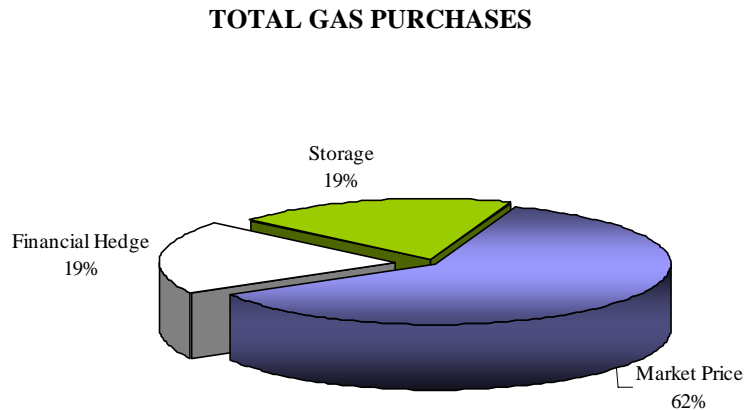
Historical hedging results for PGC Customers:

Fiscal Year	Decatherms Hedged	Actual Cost	Market Cost	Savings/ (deficit)
03	2,715,000	\$10,686,750	\$15,008,765	\$4,322,015
04	3,495,000	\$19,342,725	\$18,588,025	\$(754,700)
05	1,800,000	\$12,450,535	\$11,281,820	\$(1,168,715)
06	2,945,000	\$30,953,871	\$29,622,213	\$(1,331,658)
Totals	10,955,000	\$73,433,882	\$74,500,823	\$1,066,942

Historically, DPU has sold approximately 8 to 10 million decatherms to their PGC customers during the winter heating seasons. During FY05-06 heating season, the gas rate team approved the following hedges:

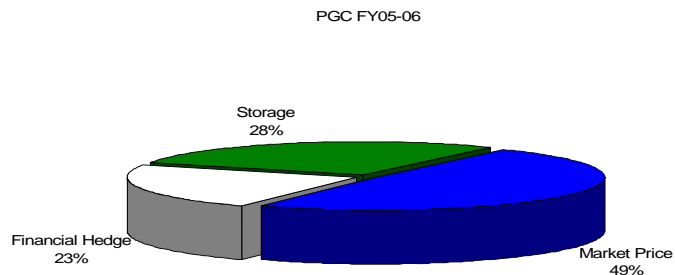
Date	Decatherms Hedged
May 2005	1,735,000
November 2005	1,210,000
Total	2,945,000

According to the Fuels Procurement Administrator, 62% of gas purchases were market-based prices, 19% each were purchased using financial instruments and storage as a hedge. This information is depicted in the following pie-chart:



Source: DPU

According to DPU representatives, Richmond has hedged primarily for the PGC customers which include all non-industrial classes. The PGC hedges and storage for FY06 were 23% and 28% of total PCG demand, respectively, as depicted in the following chart.



Based on the above information, it appears that DPU may be able to better position themselves to manage risk of price volatility.

***Technical
Expertise***

It has been acknowledged that this is a very complex subject and the process is sensitive to market conditions. The Fuels Procurement Administrator has a good handle on the hedging process; however, he may not have the expertise in a variety of options available for this process. In addition, entrusting the entire process to one individual may cause

problems in the future when there is a turnover in that position.

Gas utility companies engage in various hedging techniques to stabilize their gas supply costs and thereby protect their customers against the unpredictable market conditions. There are mainly two categories of hedging tools:

1. Physical possession of natural gas stock that deals in taking actual delivery of the stock for consumption purposes. For example, purchasing natural gas in bulk quantity and storing it for future use provides a hedge or protection against the future price increases. Another example is the use of futures (fixed price) contracts, which is an agreement to buy specific quantities of a commodity at a specified price. However, if the prices fall, the utility company will suffer losses. This option is most appropriate in the market where future conditions are reasonably predictable.

2. Financial tools are more flexible and do not compel the utility company to take an actual delivery. These include the use of “options” which may give the utility a right to carry out a transaction but does not create an obligation to compel completion of transaction. This can be illustrated by an example as follows:

A company buys an option to purchase 10,000 units of gas at a price \$10 per unit three months from the date of transaction and pays \$0.25 per unit premium. The company's cash outlay is \$2,500 (10,000 x 0.25). If the price increases to \$12, the company can exercise the option and save \$17,500 (difference in price x 10,000 - 2,500). However, if the price falls to \$8.00 the company can buy the gas in open market without exercising the option and save \$17,500 (difference in price x 10,000 - 2,500).

The above example represents only one of the financial tools. There are many other ways these tools can be employed to benefit Richmond consumers.

From 1994 through 2002, the Department of Public Utilities hedging strategy only included fixed price hedging based on

NYMEX futures for all customers. In 2003, DPU also began utilizing the call option strategy for PGC. DPU still utilizes fixed price hedging for the LVS customers.

It appears that to ensure effectiveness of managing **\$192,522,362** expenditure the City may need additional expertise to explore the full potential of using financial tools. The City may cover the risk of price volatility for much larger portion of the total annual demand for natural gas and generate substantial savings. Although the purpose of these tools is not to make a profit or engage into speculative transactions, Richmond consumers could benefit from:

- a. The right type of expertise,
- b. Financial tools
- c. Constant awareness of market conditions

Recommendation

3. *Require DPU to hire a professional firm engaged in dealing with natural gas and energy trading to assist the City in managing future hedging transactions.*

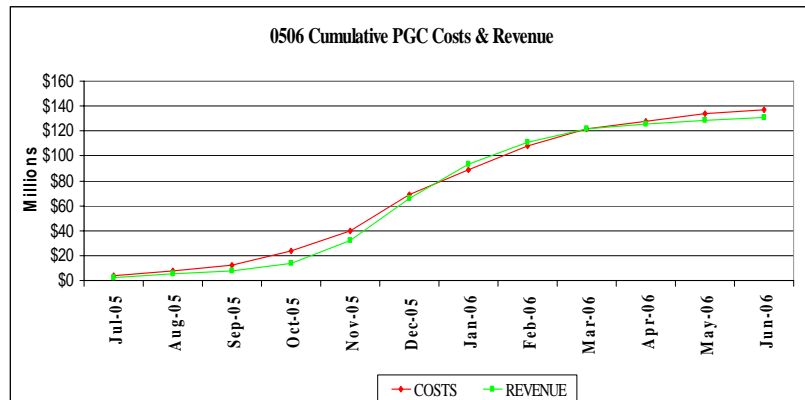
Management

Response

DPU agrees with this recommendation and will hire a professional firm to assist with hedging by March 31, 2007.

Customers' Rates

Customers' rates have remained relatively constant with DPU's costs. The graph below shows the customers' rate cumulative history versus DPU cumulative costs. Even after Hurricanes Katrina and Rita hit the Gulf Coast area last summer, DPU continued its efforts to control customers' costs. The graph depicts the FY05-06 cumulative PGC costs and revenues.



Conclusion

DPU appears to have managed customers' natural gas rates very effectively. As discussed before, they have used hedging techniques to alleviate the impact of price volatility. However, there is a room for improvement.



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Your feedback helps us do a better job. If you would please take a few minutes to fill out the following information for us, it will help us assess and improve our work.

Please rate the following elements of this report by checking the appropriate box.

	Too Little	Just Right	Too Much
Details	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Suggestions for our report format _____

Suggestions for future studies: _____

Other comments, ideas, thoughts: _____

Name (Optional): _____

Thanks for taking the time to help us.

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